2.0 DESCRIPTION OF THE PROPOSED PROJECT

2.1 INTRODUCTION

This EIR examines the environmental impacts associated with operation of the Chevron Richmond Long Wharf Marine Terminal (Long Wharf) under the proposed new thirty (30)-year lease. Since the Long Wharf is currently operating, this EIR examines the effects of the existing Long Wharf operations over the proposed 30-year lease period. Section 2.2, Project Background, presents an overview of the existing Long Wharf structure, and Section 2.3, Proposed Project, describes the proposed Project (continued Long Wharf operations). Alternatives considered in this EIR are presented in Section 3.1, Factors Used in Selection of Alternatives, and the cumulative projects considered for the analysis are presented in Section 3.4, Cumulative Projects.

2.1.1 Regional Setting

Five of California's largest refineries are located in the Bay Area. In addition to the Chevron-Richmond Refinery, these include Shell and Tesoro at Martinez, Tesoro at Avon, Valero at Benicia, and ConocoPhillips at Rodeo. These refineries generally run a combination of Alaskan North Slope (ANS) and/or San Joaquin Valley (SJV) crudes along with foreign crude, mostly condensate.

All of these refineries have marine terminals. In addition to receipt of oils via the marine terminals, transport also occur via pipelines. At present, Shell, Tesoro, Valero, and ConocoPhillips have pipeline connects to the Shore marine terminal which is an upland storage facility with no refinery. Other pipelines in the area include the Texaco pipeline from the SJV, a heated, proprietary system that supplies San Joaquin Valley Heavy (SJVH) crude to ConocoPhillips, Valero, and Shell. ConocoPhillips facility in Santa Maria processes local heavy crude, including some from the outer continental shelf (OCS) and SJVH and transports the product stream to ConocoPhillips Rodeo for further refining through ConocoPhillips Oleum Pipeline. Chevron Pipeline Company also operates a common carrier line importing SJV crude to the Bay Area. ConocoPhillips, Shell, and Chevron-Richmond all have connections to this pipeline.

In addition to the above refineries, there are 8 ports, 26 marine terminals, and 2 naval terminals in the Bay. The naval terminals include the Concord Naval Weapons Depot. The Point Molate Naval Fuel Depot, just north of the Chevron Refinery, has undergone base closure activities and is planned to be developed with a hotel-casino-resort. The former Moffat Naval Air Station has been closed and is currently used for NASA operations.

A breakdown of vessel calls in terms of passenger and cargo vessels, tanker traffic, tow or tug, and barges is provided in Section 3.4.3, Regional Characteristics of Crude/Product Transportation in Bay and Along Coastal Shipping Lanes off Northern

Figure 2.1-1 – Location of Terminals

California, with numbers based on *Waterborne Commerce of the United States, Calendar Year 2003, Part 4 – Waterways and Harbors of the Pacific Coast, Alaska and Hawaii* (Corps 2003). For discussion purposes, the marine terminals have been grouped as follows:

- Port of San Francisco/San Francisco Harbor;
- Port of Redwood City;
- Port of Oakland/Oakland area;
- Richmond area; and
- Carquinez Strait and farther inland.

Port of San Francisco/San Francisco Harbor

The Port of San Francisco is the nation's fifth largest port in terms of vessel calls with 3,623 vessel calls in 2003, slightly less than the 3,639 calls in 2002 (U.S. Department of Transportation, Vessel Calls at U.S. Ports, 2003). A portion of all marine traffic into and out of the San Francisco Harbor area occurs at this port. The port's marine facilities cover 145.1 acres and include cargo handling for containers, roll-on roll-off goods, and break-bulk commodities. The port operates eight shoreside container cranes in 40-foot water and provides full on-dock rail service. From 1988 to 1998, container vessel calls in/out of the Port of San Francisco averaged about 600 per year (Long-Term Management Strategy [LTMS] 1998). In 2003, total inbound and outbound vessel trips for the entire San Francisco Harbor area totaled 69,997 vessels, of which were tankers (Corps 2003). The majority of the vessels trips were passenger traffic and vessels carrying dry cargo (Corps 2003).

Port of Redwood City

The Port of Redwood City handles primarily cement, lumber, scrap metal, and dry bulk commodities for firms located near the port. The port also has facilities for handling liquid bulk, petroleum products, and general cargo. The port is also a USCG certified oil waste reception facility. Facilities include five wharves. Total inbound and outbound vessel trips were approximately 279 in 2003, but no tankers (Corps 2003).

Port of Oakland/Oakland Area

The Port of Oakland, the 4th largest seaport in the nation, was established in 1927, and is a world-class international cargo transportation and distribution hub. The Port of Oakland occupies 19 miles of waterfront on the eastern shore of San Francisco Bay, with 665 acres devoted to maritime activities and another 3,000 acres devoted to aviation activities. Since 1962, the Port has spent more than $1.4 billion to construct 1,210 acres of marine terminals, intermodal rail facility, and maritime support area. This

includes over $700 million for the current Vision 2000 program, which includes development of two new maritime terminals, a new intermodal rail facility, deepening channels and berths from -42 feet to -50 feet, and a new public park and wildlife habitat. Most of the landside projects have been completed or are nearing completion while the dredging program, which started in October of 2001, will take approximately five to six years to complete. Oakland's 20 deepwater berths and 35 container cranes are supported by a network of local roads and interstate freeways, warehouses and intermodal railyards. The Oakland area also supports numerous other terminal facilities not strictly within the Port of Oakland, but considered a part of the Oakland area. These include additional container terminals and a variety of large and small recreational craft harbors.

In 2003, inbound and outbound vessel trips for the entire Oakland Harbor area totaled 22,884 vessels, 4 of which were tankers (Corps 2003). The majority of the vessels trips were passenger traffic and vessels carrying dry cargo (Corps 2003).

The former Oakland Army Base (OARB), consisting of 368 acres, is also located in the Oakland Harbor area, and was approved by the Department of the Army for closure in 1995. In July 2002, the Oakland Base Reuse Authority (OBRA) adopted a Final Reuse Plan for the OARB. Property acquired by the Port from the Army is being used to construct and operate new Outer Harbor mega-terminals (Port of Oakland Website, http://www.portofoakland.com/maritime/factsfig.asp September 2005).

Port of Richmond/Richmond Area

Facilities in the Richmond Harbor are located in three areas: at Richmond, on Harbor Channel, and on Santa Fe Channel. The Port of Richmond provides seven City-owned terminals on a 35-foot deep shipping channel. These facilities handle commodities such as petroleum products, chemicals, petrochemicals, vegetable oils, molasses, vehicles, steel and wood articles, and containerized articles. Two concrete finger piers are available for vessel lay-ups, with five dry docks for lay-ups. At Point Richmond, just south of the Richmond-San Rafael Bridge, but north of the Port of Richmond, is the Long Wharf and Refinery.

The Port of Richmond also includes 11 privately owned terminals. The facilities handle bulk liquid products, scrap metal, various dry-bulk, and break-bulk commodities. The Chevron USA petroleum shipping and terminal operation facility is located in the Richmond area.

Carquinez Strait and Farther Inland

A number of terminals are inland of the Carquinez Bridge. Terminals in the Carquinez Strait include C & H Sugar Company Refinery (for sugar processing only), and several marine terminals including; Shore Terminals LLC, Martinez Refinery Company Wharf; Tesoro Corporation, Amorco, and Avon Wharves; Valero Benicia Refinery crude oil and product wharf; and Tesoro Corporation, Pittsburgh. The Concord Military Ocean

Terminal is located in Concord, and other terminals for non-petroleum products are also located in Pittsburgh. Other terminals are located in Suisun Bay, Sacramento, and Stockton. In 2003, there were 6,001 vessel trips through the Carquinez Strait, including 819 tankers (Corps 2003).

2.2 PROJECT BACKGROUND

2.2.1 Long Wharf History

Chevron's Richmond Refinery (Refinery) began operations on July 3, 1902, under the ownership of the Pacific Coast Oil Company. The Long Wharf was also constructed in 1902, but began operating after the Refinery. Crude was initially shipped via railcar from the San Joaquin Valley until the Long Wharf became operational later that year. At that point, the S.S. George Loomis, the first tanker on the Pacific Coast delivered the crude shipments. In 1905, Standard Oil Company of California (now Chevron U.S.A., Inc.) bought the Refinery, which was then the largest refining plant on the Pacific Coast, and one of the largest in the world, processing 10,000 barrels (bbls) of crude oil daily.

The Refinery operations use the Long Wharf to receive all its crude oil, and some intermediate feed and blending stocks from across the Long Wharf. In addition, the Refinery uses the Long Wharf to ship products and intermediate stocks to domestic – i.e., southern California and the Northwest – and foreign markets.

The Long Wharf was originally a wooden structure supported on timber piles, but was modified in 1946 with the construction of a concrete wharf and causeway structure supported on deeper, concrete piles. Three buildings and a concrete repaired Long Wharf were also built in 1946. In 1974, the Long Wharf was modified to accommodate larger vessels; Berth No. 1 was expanded and Berth No. 4 was extensively modified. Over the years, improvements have continued. Recent improvements include a southern capstan platform added to Berth No. 4 in 1986, a breasting dolphin at Berth No. 3 in 1990, and a VCS installed in 1991. In 2000, a major structural upgrade program was completed that will enable the structure to withstand a 475-year return period seismic event resulting in minor, repairable damage with no oil spills. In November 2004, the Long Wharf completed a comprehensive electrical infrastructure upgrade project.

2.2.2 CSLC Lease Boundary and Regulatory Boundary Areas

The Chevron Richmond Long Wharf is located adjacent to Chevron's Richmond Refinery in Contra Costa County, as shown in the vicinity map (Figure 2.2-1). The Long Wharf lies just south of the Richmond-San Rafael Bridge and Castro Point, west of Point Richmond, and north of the Richmond Inner Harbor Entrance Channel and within 5,500 feet of the entrance to Southampton Shoal Channel. The lease area covers 67.66 acres of the San Francisco Bay, offshore of the city of Richmond, with water depths ranging from 6 to 50 feet Mean Lower Low Water (MLLW). The lease area is

entirely underwater. The Long Wharf has been operating under a lease from the California State Lands Commission (CSLC) since 1947. The lease boundary is shown in Figure 2.2-1.

2.3 PROPOSED PROJECT

2.3.1 Project Action

The CSLC is considering granting a new 30-year lease of California sovereign lands to Chevron. The lease, if granted, would allow the Applicant to continue its existing Long Wharf operations.

2.3.2 Physical Description of Long Wharf

Long Wharf Configuration and Berthing Capacities

The configuration of the Long Wharf, causeway and pipeline trestle is shown in Figure 2.3-1 with details of the Long Wharf shown in Figure 2.3-2. The Long Wharf, a T-head pier, is 3,440 feet long, comprised of four berths and two breasting dolphins. It is constructed on concrete and steel piles with a concrete superstructure. The causeway, pipeway trestle, and low sulfur fuel oil (LSFO) pipeway trestle are approximately 4,200 feet long, and approximately 26 feet, 55 feet, and 20 feet wide, respectively. The surface of the causeway road rises from approximately 13 feet above MLLW at the shore to approximately 15.6 feet above MLLW at the piers.

Four deep water cargo berths (Berths No. 1 through No. 4) are on the west side of the pier and two inner cargo berths (Berths No. 9 and No. 11) are on the east side. Several additional berths (Berths No. 5, No. 7, A, and B) provide temporary moorings for standby tugs and barges, and launching facilities for crew and oil spill response boats.

The main portion of the Long Wharf (housing all berths except A and B) is approximately 2,460 feet long and 110 to 132 feet wide, tees off the causeway, and extends approximately 670 feet south and 1,790 feet north from it. Its surface is approximately 15.6 feet above MLLW. The northern mooring dolphin, adjacent to Berth No. 4, extends approximately 580 feet beyond the end of the pier. The southern mooring dolphin, adjacent to Berth No. 1, extends approximately 400 feet beyond the southern end of the pier. The Long Wharf houses Berths A and B, and is approximately 480 feet long by 50 feet wide.

Figure 2.2-1 Site Map Chevron Richmond Long Wharf

Figure 2.3-1 – Chevron Richmond Long Wharf Components

Figure 2.3-2 – Richmond Long Wharf Structure Locations

Figure 2.3-2 – Richmond Long Wharf Structure Locations

The characteristics of each berth are provided in Table 2.3-1. The Refinery's U.S. Army Corps of Engineers (USACE) permit establishes the maximum allowable dredge depths. The maximum dead weight tonnages (DWTs), lengths, and beams are described in the facility's Operations Manual (October 1998, Rev. 17, April 24, 2005). Berths No. 1 and No. 4 are used for ship cargo transfers, and Berths No. 2 and No. 3 are used for ship and barge cargo transfers. The typical practice is to berth tankers from 27,000 DWT to a maximum 150,000 DWT with lengths not exceeding 950 feet in Berth No. 1. Berth No. 2 accommodates barges and tankers up to 62,000 DWT, and not longer than 700 feet . Barges and tankers from 17,000 to 62,000 DWT, with lengths less than 800 feet, berth in Berth No. 3. Berth No. 4 accommodates tankers from 50,000 to 272,000 DWT, with lengths less than 1,110 feet. Berths No. 1 through No. 4 can accommodate vessels with beams up to 200 feet. On occasion, a freighter-tanker will load oil in Berth No. 2. The varying depths of berths accommodate the different drafts of ships that moor at those berths.

Table 2.3-1
Berth Characteristics

Berth Number	Berth Dredge Length (feet)	Berth Dredge Depth (MLLW) (feet)	Berth Dredge Width (feet)	DCMAs/ Hoses	Vapor Recovery System
1	1,150	-50	200	DCMAs	No
2	700	-40	200	Hoses	Yes
3	800	-40	200	DCMAs	Yes
4	1,200	-50	200	DCMAs	Yes
5	~550	-19	----	n/a	n/a
7	~550	-15	100	n/a	n/a
9	995	-20	300	Hoses	Yes
11	*	-20	300	Hoses	No
A	~350	-19	----	n/a	n/a
B	~375	-15	----	n/a	n/a

MLLW (Mean Lower Low Water).
DCMA (Double Counter Weighted Marine Arms).
n/a (not applicable).
*** Included with Berth No. 9.**
Source: Chevron Lease Application.

Berth No. 5, east of Berth No. 1, serves as a mooring area for towboats awaiting vessel arrivals and departures, or as a standing-by area for barges involved in cargo transfers. Berth No. 7, east of Berth No. 2, serves as a storage area for barges. Berths No. 9 and No. 11, east of Berths No. 3 and No. 4, are primarily used for transfers to/from barges up to a maximum of 65,000-bbl capacity. Berths A and B provide launching facilities for crew and oil spill response boats.

The Long Wharf is physically capable of simultaneously accommodating all of the maximum size vessels discussed above; however, for any individual ship, several variables are taken into consideration to ensure safe berthing conditions. These variables include water depth, ship draft, ship length and breadth, and environmental conditions, including wind and current speeds and directions.

Vessels owned and operated by Chevron, and vessels owned and operated by other shipping companies use the Long Wharf. Chevron's general operating philosophy is to use the largest vessels feasible for loading/unloading at the Long Wharf to reduce the number of vessels traveling to and from the Long Wharf, and to reduce freight costs. Over the 30-year lease period, double-hulled ships up to 297,000 DWT would be used as discussed further below.

Chevron, according to the current lease application, does not plan a major expansion of the Long Wharf during the 30-year period identified in the proposed Project. A Berth No. 4 Mooring Analysis was completed by Chevron in 1996 and submitted with their lease application. The report concluded that Berth No. 4, on the northwest end of the Long Wharf, may be modified to accommodate new double-hulled ships up to 297,000 DWT or higher, depending on hull materials. The U.S. Coast Guard (USCG) and the International Maritime Organization require the phasing-in of double-hulled tankers, which are larger than most crude oil carriers currently operating, but of equivalent cargo capacity. As mandated by the Oil Pollution Act of 1990, double-hulled ships will be phased into operation by 2015. An anticipated Berth No. 4 modification during the lease period would involve raising the height of the loading arms and gangway, dredging a wider berth, and upgrading the breasting dolphin. Dredging depth of Berth No. 4 would remain at the permitted depth of -50 feet MLLW. Depending on the upgrade of the breasting dolphin, a structural analysis may be required, and depending on the extent of dredging, the modifications may be subject to a subsequent focused California Environmental Quality Act analysis.

Pier Pipelines, Loading Arms, and Hoses

The pipeway trestles support 3 crude oil pipelines ranging from 16 to 36 inches in diameter, 33 petroleum product pipelines ranging from 6 to 16 inches in diameter, 2 ballast water lines of 6 and 16 inches in diameter, and 1 vapor line. Lateral lines to each berth range from 1 to 20 inches in diameter, but most are 8 to 12 inches in diameter. In total, there are approximately 54 lateral pipelines. All pipelines extend from the pier along the pipeway trestles to shore and then to appropriate storage tanks at the Refinery. No pipelines are buried or submerged beneath the Long Wharf. Five pipelines pass through an earthen and concrete berm at the shoreline as they enter the causeway through Pump Station No. 7 on the shore. Other utility pipelines handle potable water, fire, water, nitrogen, natural gas, steam, sanitary waste, and electricity. The utility lines range from 3 to 8 inches in diameter.

Berth No. 1 has two 12-inch and two 16-inch Double Counter-Weighted Marine Arms (DCMA) loading arms. The DCMAs are the articulated pipes that connect a ship and the Long Wharf's piping system. Berth No. 2 is fitted with 4-inch, 6-inch, and 8-inch hoses connected to nonflexible risers for cargo transfer. Berth No. 3 has two 8-inch and four 12-inch DCMA loading arms. Berth No. 4 has two 12-inch and three 16-inch DCMA loading arms. Barge Berths No. 9 and No. 11 are fitted with 4-inch and 6-inch Chicksan risers. The mooring systems include pelican hooks, bollards, capstans, messenger lines, and messenger line storage boxes.

External corrosion protection for pipelines, pipeline laterals, and DCMAs is provided by specialty paints, e.g., inorganic zinc based, or mastic, e.g., aluminum epoxy. The 16-inch ballast line is cement-coated for interior corrosion protection. Other pipelines, laterals, and DCMAs do not have internal corrosion protection. Cathodic protection is provided only on the LSFO bents; the balance of the structure has a grounding system that was extensively modified during the 2004 Electrical Infrastructure Upgrade Project.

The Long Wharf also has 20 cargo hoses, ranging from 4 to 8 inches in diameter, and 4 vapor hoses of either 8 or 10 inches in diameter. Hoses have manufacturer's recommended interior and exterior coatings that are resistant to the products for which they are used.

Stormwater Management, Drip, and Recovered Oil Facilities

There is no formal stormwater management plan for the Long Wharf. Stormwater is managed through procedures outlined in the Wharf Operations Manual as described in the paragraphs below. The Long Wharf is designated as a discharge point in the Refinery's National Pollution Discharge Elimination System (NPDES) permit.

The transfer area of each berth is impounded by a raised berm. Drip pans at the Long Wharf are located under all piping manifolds at the berth areas and are designed to collect drips from bolted flanges, fittings, and expansion joints. Collected oil and water (including stormwater) are drained to oily water sumps along the inside face of the Long Wharf. These sumps pump excess drainage to recovered oil tanks onshore in the Refinery, where it is processed with other recovered oil sources and plant process water (see below, Ballast Water Discharge Controls). Some drip pans, typically those under expansion joints, do not drain to sumps, but are emptied by vacuum truck.

Sump levels are controlled via an automatic level controller which pumps out automatically at predetermined levels. All sumps have manual override controls. Sump pump operation is checked each shift. Sumps are equipped with visual and audible high-level alarms that activate at both the berth and Control Room.

Ballast Water Discharge Controls

A ship carrying little or no cargo rides high in the water, having less draft than a loaded ship. Ballast water intake allows a ship to ride lower in the water, thus being less

vulnerable to being knocked over by high waves and winds, less vulnerable to the bow being slammed when riding over high waves, and less potential for the propeller to raise out of the water. Ballast water is also loaded or discharged to adjust a ship's trim, improve maneuverability, increase propulsion efficiency, reduce hull stress, raise the ship to pass over shallow areas (reduce draft), and lower the ship to get under bridges or cranes (lower air draft). Ballast water enters a ship through intakes located below the waterline. Depending on the level of the tank relative to the water surface, water may be taken in or discharged either by pumping or by gravitational flow. Ballast water is generally carried in several different compartments on board ship, often in tanks dedicated solely to that purpose, and referred to as "segregated ballast water." Some tankers carry ballast water in their cargo holds, and are referred to as "nonsegregated ballast water", since they contain mixed contaminants or remnants of the material that was last in that cargo hold. Ships releasing water from other areas can also introduce harmful nonindigenous aquatic species (NAS) to ecosystems and economies.

Long Wharf bound vessels comply with the California Ballast Water Management for Control of Nonindigenous Species Act of 1999 and California Public Resources Code sections 71-203 to 71-207 that addresses ballast water management practices. Several ballast water management practices for ballast water carried into waters of the state from areas outside the exclusive economic zone (EEZ) are allowed:

- Exchange ballast water outside the EEZ (from an area not less than 200 nautical miles from land and in water at least 2,000 meters [6,560 feet or 1,093 fathoms] deep) before entering waters of the state;

- Retain the ballast water onboard the vessel;

- Use an alternative environmentally sound method of ballast water management that has been approved by the CSLC before the vessel begins the voyage, and that is at least as effective as ballast water exchange in removing or killing NAS;

- Discharge ballast water to an approved reception facility; and

- Under extraordinary conditions, conduct a ballast water exchange within an area agreed to be the CSLC at the time of the request.

Vessels are also required to minimize the uptake and the release of NAS as follows:

- Avoid the discharge or uptake of ballast water in areas within or that may directly affect marine sanctuaries, marine preserves, marine parks, or coral reefs.

- Minimize or avoid uptake of ballast water in all of the following areas and circumstances:

    - Areas known to have infestations or populations of harmful organisms and pathogens;

- Areas near a sewage outfall;
- Areas near dredging operations;
- Areas where tidal flushing is known to be poor or times when a tidal stream is known to be more turbid;
- In darkness when bottom-dwelling organisms may rise up in the water column; and
- Where propellers may stir up the sediment.

The Long Wharf complies with the Invasive Species Act. Every ship entering State waters is required to submit a copy of a ballast exchange plan, including cites, with latitudes and longitudes, or specific harbor information on where any exchange has taken place. That plan is submitted to the state and federal agencies having authority for the program; and Chevron vessel agents receive copies. Those copies are available for inspection.

The Refinery discharges treated process water effluent to San Pablo and San Francisco Bays under the NPDES Permit issued by the California Regional Water Quality Control Board. This Permit allows the discharge of treated process water effluent associated with petroleum refining, petrochemical manufacturing, and research to a deep-water outfall in San Pablo Bay. Long Wharf process water is transferred to the Refinery recovered oil system (ROS). Oil from the ROS is recycled in the Refinery's process plants and the oily water is transferred to API Separators where further oil/water separation occurs (primary treatment). Oily water from the separators is then transferred to an Aggressive Biological Treatment Unit (secondary treatment). Some of this treated process water (0-3 million gallons per day) receives further treatment in the Experimental Water Enhanced Wetland (tertiary treatment). All treated process water is then filtered through Granular Activated Carbon (final polishing) prior to being discharged per the NDPES Permit. This treated process water effluent may contain nonsegregated ballast water. The Refinery does not maintain records on nonsegregated ballast water.

Biologically treated effluent from the Refinery's effluent treatment system is used in the Refinery's firewater system and may be discharged at the Long Wharf. This water is discharged during tests of, or maintenance on, the fire protection system.

Vapor Control System

A Vapor Control System (VCS) was installed at the Long Wharf in 1991 to comply with the Bay Area Air Quality Management District (BAAQMD) Regulation 8, Rule 44 (Organic Compounds, Marine Vessel Loading Terminals). This regulation limits hydrocarbon emissions to the atmosphere from marine vessels being loaded under

certain conditions, e.g., loading with high vapor pressure products. In the absence of vapor controls, hydrocarbon vapors escape from the cargo compartment when they are displaced during liquid product loading. The VCS also meets the CSLC's Structural Requirements for VCSs at Marine Terminals (California Code of Regulations [CCR] Title 2, Division 3, Chapter 1, Article 5.4). The Marine Oil Terminal Engineering and Maintenance Standards (MOTEMS) become effective on February 6, 2006. The MOTEMS regulations will supersede the CCR Title 2 VCS regulation.

Berths No. 2, No. 3, No. 4, and No. 9 are equipped for vapor control. These berths can collect vapors independently or simultaneously with the other berths. Berths No. 1 and No. 11 are not required to have vapor control because of the kind of petroleum liquids loaded and the type of liquids previously carried in the receiving cargo tanks, e.g., low vapor pressure stocks like fuel oil.

During loading, hoses are connected to each tanker or barge to recover vapors via a vacuum pump system. Instrumentation monitors and prevents reverse vapor flows (from the Long Wharf to the ship), and also alerts personnel. The hoses are connected to the vapor recovery pipeline system located along the edge of the Long Wharf that transports the vapors to the Emission Reduction Device, located upland on the Refinery property, where they are combusted.

Buildings

Structures on the Long Wharf include a Long Wharf vapor recovery vacuum pump house (including analyzer building and shelters at appropriate berths), a marine maintenance center that also houses the oil spill response center, and an office building. There is a central control room in the two-story office building at the western end of the causeway across the main Long Wharf from Berth No. 2. A small laboratory is adjacent to the causeway near Berths A and B. The location of these buildings is shown in Figure 2.3-2. Each berth that handles cargo operations is equipped with a personnel shelter from which the Berth Operator can monitor operations.

Personnel and Communications

The Long Wharf operates 24 hours per day, 7 days per week. Existing Long Wharf policy requires a "Terminal Person in Charge (TPIC) be on duty and immediately available for each ship or barge that is performing cargo operations. A maximum of 6 operators, in addition to the Lab Coordinator and Head Operator, are onsite. The Area Supervisor is in charge of the facility and oversees its operation and the operators. The Head Operator oversees individual operators in the execution of specific transfer operations. A qualified Berth Operator (TPIC) is responsible for monitoring vessel movement while moored at the Long Wharf, operator handling of mooring lines, and the operator handling of transfer operations. The Berth Operator is assigned a berth to manage during the entire transfer process. The operator is responsible for proper handling of Long Wharf valves and pipelines. Each operator closely watches their designated area at all times for noise, visible emissions, odors, and oil spills. Individual

Berth Operators are advised of line routing and product/line availability from the Pad Coordinator, who is stationed in the Control Room. The Long Wharf Lab Operator, responsible for drawing samples to ensure product quality, operates out of the laboratory.

Cargo vessels moored at the Long Wharf must be manned, and maintain watch onboard to monitor activities and cargo operations. This consists of, at a minimum, one Deck Officer, one Engineering Officer, two able bodied seamen, and in most cases, one or more unlicensed engineers and a pump man. In conjunction with cargo watches, vessels are required to maintain continuous watch of the gangway and notify the vessel officer in charge of all visitors coming on board. Barges containing cargo operate similarly, typically by a single qualified barge operator. Chevron employees, including those on Chevron vessels, use employee photo identification.

Communication between ship and shore is required in English. The primary method of communication is through intrinsically safe radio units provided by the Terminal. Portable radios are loaned to the ship's staff for communication with the Berth Operator. Communication between the Berth Operator and other Refinery personnel is by telephone or radio to the Control Room.

Security

The Long Wharf complies with section 2351 of CCR Title 2, Division 3, Chapter 1, Article 5, outlining a physical security program for marine terminals. Chevron allows only authorized personnel access to the Long Wharf, and only through the Refinery property and its system of security gates. Personnel entering the Refinery must have a Chevron Company badge or be an invited guest. Officers and crew on domestic fleet Chevron tankers wear company badges, and may enter the refinery by showing their employee badge. Non-Chevron and non-domestic Chevron tankers must provide crew lists to the Long Wharf operations personnel during the pre-transfer conference, which are then distributed to the Refinery entrance gates. Personnel from these ships are cleared into the Refinery using those crew lists. In addition, Long Wharf operations and personnel receive notification from the Refinery gates when other people, such as vessel agents, electronics specialists, repairmen, etc., request entry to the Long Wharf to access specific ships. Long Wharf operations personnel confirm with the ship if the people requesting entry are authorized for ship access prior to allowing them entry into the Refinery and the Long Wharf.

Vehicles have restricted access to the Long Wharf. Only Chevron company vehicles and other vehicles pre-authorized by Long Wharf personnel are allowed. A shuttle bus transports company and contract seafarers to and from the "marine" parking lot and/or Refinery gates to the Long Wharf. Pedestrians do not have access to the Long Wharf. Approximately 60 trucks per day associated with routine operations and maintenance

activities and deliveries of vessel-engine lube oils, maintenance materials, and ship stores access the Long Wharf, and are subject to the same pre-authorizations and clearance as other visitors and vehicles. Chevron has no railcar access to the Long Wharf.

Exterior lighting is provided at the Long Wharf to allow for nighttime operations. Lighting is provided by permanent fixtures between sunset and sunrise, and during times of reduced visibility.

The Long Wharf cannot be accessed from adjacent public shore areas; controlled fencing provides security along the refinery perimeter.

2.3.3 Operational Procedures

Oil/Product Transfer Procedures

Information on operating procedures is detailed in the Long Wharf's Operations Manual, updated in October 1998. Upon arrival of a vessel at the Long Wharf, the Head Operator boards the vessel, inspects it, and holds a pretransfer conference with the Vessel Person In Charge (VPIC) to discuss the transfer operation procedures. The Long Wharf's Declaration of Inspection and Safety Checklist must be signed by the VPIC and the TPIC (or Berth Operator), prior to cargo transfers.

Prior to a vessel's arrival, cargo hoses are typically connected to the Long Wharf riser and DCMAs are tested to ensure they are functioning properly. Once the vessel is moored, the empty hose or DCMA is extended to the vessel, the end is unplated, and connections completed. Then the connections are inspected by the Berth Operator prior to the start of cargo transfer. For loading operations, once the vessel's operator has notified the Berth Operator that all lines are set properly and all valves are open, the Berth Operator starts the cargo transfer by slowly opening all appropriate valves. After ensuring that the transfer operation is proceeding satisfactorily, the Berth Operator gradually increases flow rates.

The deck mate must maintain communication with the Berth Operator at all times during the transfer, either directly or with unit radios provided by the Long Wharf.

When transferring cargo or ballast, the vessel must have an officer in charge of cargo transfer and two assistants: one to maintain watch on the open-deck cargo transfer manifolds, and the other to assist in handling valves, tank gauging, or shutdowns of transfer pumps in case of an emergency. Other crewmembers may be needed depending on the size and complexity of the ship transfer system. These requirements are established at the transfer conference.

During cargo transfer, the Berth Operator monitors the cargo transfer using the computer monitor provided in the personnel shelter. The Berth Operator can verify loading/discharge rate, anticipated time of transfer completion, shore tank temperatures,

and other factors. The Berth Operator regularly checks the operating area for oil leakage, odors, noises, proper alignment of the cargo apparatus, and correct operation of the Vapor Recovery System (VRS) (if recovering vapors). The Berth Operator, observing any hazardous conditions, responds appropriately, which may include stopping cargo transfer.

The Berth Operator is notified by the VPIC that the cargo loading operation is nearly completed. The Berth Operator is responsible for notifying any pump stations that may be on standby, reducing the loading rate, standing by the shutdown equipment, remaining in communication with the VPIC, stopping the transfer at the appropriate time by closing valves, and evacuating the cargo arms/hoses prior to disconnecting.

Upon completion, the hoses or DCMA loading arms are drained into the vessel's tanks if the vessel's risers are below the level of the Long Wharf riser, or evacuated with a suck-out pump if the vessel's risers are higher. The cargo hose or DCMA loading arm is disconnected and capped prior to removing the hose from the vessel. A plastic bag is placed over the DMCA loading arm used for black oil transfers. The Berth Operator again verifies that there have been no leaks or other environmental concerns, and then assists with final paperwork and vessel departure. A vessel may either load product or unload crude oils during an operation. If the vessel can accommodate both crude and product or more than one product, a separate operation may be performed using separate vessel tanks and hoses to protect against contamination.

At the conclusion of vapor recovery operations, the vapor hose is purged with nitrogen prior to disconnecting from the vessel's manifold.

Long Wharf Inspection Programs

Long Wharf inspections are performed by the USCG, the BAAQMD, the State Fire Marshall, and the CSLC's Marine Facilities Division (MFD). The BAAQMD has the authority to issue Notices of Violation as well as take more severe enforcement if warranted. The Fire Marshall's jurisdiction ends at the shore block values. The USCG and CSLC have jurisdiction over Long Wharf operations. Over the years, the MFD has and continues to conduct structural, mechanical/electrical and engineering inspections of the Long Wharf. In addition, an audit was completed in March 1998, that included an extensive underwater inspection of the Long Wharf. Chevron Inspection and Maintenance Division self-certifies maintenance and inspections of the facility.

The Long Wharf equipment inspection program consists of three main elements:

- structural inspection;
- pipeline inspection; and
- annual component inspections.

A three-phase structural inspection plan was established in June 1992 for the Long Wharf. Each phase addressed the inspection of a different section of the Long Wharf with the goal of inspecting all components. Chevron developed a record keeping system to identify each structural component, and document conditions detected, measures taken, and repairs made on that component. The system is maintained on a computer database that tracks detailed information, drawings of the components, and field inspection notes. A comprehensive structural upgrade program is has been completed to improve safety during a seismic event. Section 4.11, Geological Resources/Structural Integrity Review, provides a discussion of the upgrade program.

The Long Wharf Operations Manual requires a comprehensive annual monitoring of pipelines. Each pipeline is visually examined over its length and full circumference for any signs of external corrosion, deteriorated protective coating, support or movement problems, or insulation defects. In addition, pipelines are visually inspected during the course of routine operations for any problems.

Pipelines are hydrostatically tested in accordance with MOTEMS Section 3109F – Piping and Pipelines – which incorporates conformance with Title 2, CCR, Article 5.5 sections 2564 and 2565 to assure they pass testing pressures above the normal maximum operating pressure to assure safety, after undergoing the following inspections:

- Each pipeline is thoroughly inspected (triennially) using a review of past ultrasonic (UT) and radiographic (RT) gauge point measurements, internal corrosion rates, and external corrosion problems;

- Insulated lines have areas of the insulation removed for inspection and UT gaging;

- UT measurements are taken along the length of the line at established gauge points and at other random areas to detect any loss of metal wall thickness or signs of internal corrosion;

- Radiographs are made at established and at random points to evaluate the degree and type of internal corrosion; and

- The UT records and radiographs are evaluated and compared to previous measurements. New corrosion rates and remaining safe life are calculated. If the corrosion allowance is determined to be insufficient until the next hydrostatic test, replacement of the affected section will be scheduled prior to the hydrotest.

Safety controls and alarms on transfer pipelines include flow meters and high-pressure monitors and alarms. Flow meters are monitored during transfer operations. Accuracies are routinely checked by flow rate comparisons between ship tank gauges and shore tank gauges. Pipelines have high-pressure alarms set at approximately 250 pounds per square inch (psi). Alarms sound in the Control Room as well as the affected Berth area. Chevron tests the pressure alarms quarterly.

On the DCMAs, an audible alarm will sound if a vessel drifts along the Long Wharf in excess of 7 feet while the DCMAs are attached or when the maximum angle between inboard and outboard arms exceeds 165 degrees.

Chevron pressure-tests relief valves on the Long Wharf annually. Temperature and pressure gauges involved in Long Wharf operations are calibrated annually. All drip pans are visually inspected annually and leak tested in conjunction with annual pipeline inspections. Sumps are equipped with visual and audible high-level alarms that are activated at the berth and Control Room. Audible alarms are tested each shift, and sump high-level alarms are tested weekly. The USCG inspects the VCS annually as part of their annual inspection.

Hose inspection and testing programs consist of semi-annual visual inspections, yearly hydrostatic tests, and yearly vacuum tests. In addition, hoses are externally inspected prior to each use.

Annual facility electrical inspections are conducted to identify any damaged, worn, broken, or misinstalled electrical equipment. Electrical inspections are also routinely conducted on motor vehicles used in the berth areas (these vehicles are spark-modified to eliminate potential vapor ignition sources). Electrical continuity tests on hoses and insulating flanges are conducted quarterly.
Additional details on the pipeline and component inspection programs are presented in Section 4.1, Operational Safety/Risk of Accidents.

Emergency Shutdown Systems

Emergency shutdowns at berths are conducted by the Berth Operator using mechanical valves located at each manifold riser or at the manifold of each DCMA loading arm. These valves all can be closed within 60 seconds. Either Long Wharf or vessel personnel can initiate emergency shutdown.

Many pipelines are equipped with flow meters that enable employees to monitor transfer operations, specifically, in the Control Room by the Pad Operator and at the berth by the Berth Operator. Each pipeline has a pressure monitor with a high-pressure alarm that will sound in the Control Room when pressures reach 250 psi.

Pipeline emergency block valve shutdown systems are located at shore blocks, berths, and the VRS. Each pipeline extending from the shore to the Long Wharf has a motor-operated shore block valve. All valves can be remotely closed in an emergency by a single computer command from the Control Room or can be closed mechanically in the field by Long Wharf personnel.

The VRS is automatically shut down and associated motor-operated valves on the transfer lines are closed during the following conditions: low or high pressure on the berth's vapor recovery line, backflow conditions in the vapor recovery line, and an explosive condition under the upper explosive limit within in the vapor recovery line.

The Berth Operator may also initiate an emergency shutdown by use of an emergency shutdown button, or, in the Control Room, by computer command. Calibration checks on analyzers, which are used to measure vapors for explosive limits, are conducted prior to the start of each vapor control operation.

Transfer operations may be suspended when any of the following conditions occur:

- breakdown or loss of communication between operator and vessel;
- oil spillage (on deck or to surrounding water);
- fire/explosion or security violation (on vessels or on Long Wharf);
- excessive wind that compromises safe mooring management of vessels;
- marine incidents, such as collision or impending collision, close passing vessels creating "surge" off the dock, personnel incidents on board that threaten the safe transfer of oil;
- slack mooring lines;
- significant earthquake or other natural events that compromise the safe transfer of oil; or
- vessel drifting off-spot, affecting the safe use and operation of hoses or DCMA loading arms.

The Refinery has an established procedure for notifying the necessary personnel to respond to emergencies. These personnel report to the scene or control center, then to their assigned roles. Prior to their arrival, Long Wharf personnel act as first line of defense to control the emergency. During an emergency, the Long Wharf docking whistle can blast several series of combinations to indicate emergencies for all Long Wharf and Refinery personnel.

The Long Wharf monitors the seismic response on the Long Wharf through use of a number of accelerometers. This equipment allows facility, civil, and structural engineers to quickly evaluate whether a structural response from an earthquake is sufficient to cause a shutdown of operations. Accelerometers also aid in the decision whether to conduct an underwater investigation following an earthquake.

2.3.4 Volumes, and Types of Materials Handled and Vessel Calls

As previously indicated, the Long Wharf operates 24 hours per day, 7 days per week. As described in Section 2.3.1, Project Action, Berths No. 1 and No. 4 are used for ship cargo transfers, Berths No. 2 and No. 3 are used for ship and barge cargo transfers, and Berths No. 9 and No. 11 are primarily used for barge cargo transfers.

The frequency of ships using the Long Wharf, based on vessel type and size, is summarized in Table 2.3-2.

Table 2.3-2
Frequency of Vessel Calls per Month and Capacity

Vessel Type	Weight (DWT)	Capacity [1] (bbls)	Frequency [2] (calls/month)
Very Large Crude Carriers (VLCCs)	160,000 – 272,000	1,200,000 – 2,040,000	5
Large Tankers	80,000 – 160,000	600,000 – 1,200,000	6
Medium Tankers	50,000 – 80,000	300,000 – 600,000	8
Small Tankers	10,000 – 50,000	600,000 – 380,000	16
Barges	---	10,000 – 120,000	40

[1] Maximum cargo allowed per Bay Conservation and Development Commission (BCDC) Permit No. 16-73, Amendment No. One is 150,000 tons (which equals 1,050,000 bbls).
[2] Frequency is based on January 1993 through August 1995 average.

Weight and capacity numbers are present capacity based on vessel size. However, over the long term, Chevron foresees that vessel cargoes will continue to be limited to 1,050,000 bbls per shipment per BCDC Permit No. M-16-73, as noted in the table and as noted in Chevron current Operations Manual (1998) which includes amendments through April 2005. The data presented in Table 2.3-2 are based on average number of calls per month per vessel per vessel size classification. Reports from the same period (January 1993 through August 1995) show that the maximum number of ships and barges in any one month over this time period was 101; the maximum number of ships was 49 and the maximum number of barges was 52. For the period January 2001 through March 2002, actual vessel calls per month averaged 31.4 ships (all tankers) and 27.4 barges. More recently, for the year 2004, there were 367 vessel calls (average of 30.5 per month) and 398 barge calls (average of 33.1 per month) for a total of 765 calls for the year (average of 63.7 per month). Approximately 13 percent of the barges are over 100,000 bbl capacity, with approximately 87 percent under 100,000 bbl capacity (personal communication Don Kinkela, Chevron Products Company 2002). The numbers in Table 2.3-2 are larger than more recent data, and are representative of the future maximum operational capacity of the Long Wharf. These numbers are 35 vessel calls per month or 420 per year, 40 barge calls per month or 480 per year, combined for a total of 900 vessel and barge calls. This maximum operational capacity is used throughout the environmental analysis in Section 4.0, Existing Environment and Impact Analysis, as representative for the proposed 30-year lease.

Chevron considers the Long Wharf and the Refinery to be operating at maximum capacity, and has no plans to expand operations at either. Long Wharf operations

depend on Chevron's business needs, market demand, Refinery needs, and demurrage costs. Chevron cannot increase the number of vessels conducting transfers without incurring a significant increase in demurrage costs. Demurrage is incurred if transfer operations cause delays in ship movements, either by delaying a ship's departure or arrival. As the scheduled time between ships is reduced, the possibility of delays increases. In addition, delays in shipment or receipts also affect Refinery operations and Chevron's commitments to customers.

Products transferred at the Long Wharf include, but are not limited to, crude oils, gas oil (cracked), automotive gasoline, aviation gasoline, gasoline blending stocks, jet fuel, fuel oil, lubricating oils, toluene, propylene tetramer, and naphtha.

Maximum throughput is based on the BAAQMD Permit to Operate as further discussed in Section 4.6, Air Quality. Over the last four-year period, the Long Wharf typically received approximately 98 million bbls per year (bpy) (268,493 bbls per day (bpd)) of crude oil, diesel fuel oil, gasoline components, plant feed stocks, diesel blend stock, and dirty diesel/flush stock. Of this amount, approximately 80 million bbls (219,178 bpd) are both domestic and foreign origin crude. During the same period, the Long Wharf typically has shipped approximately 39 million bbls (106,848 bpd) annually of gasoline, gasoline components, various fuels (aviation fuel, jet fuel, diesel fuel), and lubricating oils.

2.3.5 Shipping Routes

Chevron Shipping Company is a subsidiary of Chevron which provides, manages, and maintains Chevron-owned and in-chartered vessels. Ships owned by the Chevron Shipping Company which visit the Richmond Long Wharf are arriving from or departing to El Segundo, Long Beach, Los Angeles, and Martinez, California; Portland, Oregon; Mexico; Indonesia; and other foreign ports. Chevron does not maintain records on the origins/destinations of third party-owned ships.

Ships follow an established pattern from as far south as San Pedro, California, to as far north as the Cook Inlet in the Gulf of Alaska. All products supplied to the northwest United States and British Columbia are transported via ships because no product pipelines exist.

In 1992, the Western States Petroleum Association, in agreement with the California Department of Fish and Game and 10 oil shipping companies, adopted a voluntary agreement to maintain a minimum distance of 50 nautical miles offshore the mainland for loaded Alaskan North Slope (ANS) crude oil tankers transiting between Alaska and California, except when approaching from offshore into the Main (west) directed traffic area south of the Farallon Islands. This minimum distance does not apply to other crude oil tankers. The product tankers typically follow routes closer to shore at an average distance of approximately 15 to 20 miles.

The USCG has established vessel traffic lanes for north, south, and west approaches to San Francisco Bay. Each approach consists of a 1-mile-wide inbound lane, a 1-mile-wide outbound lane, and a 1-mile-wide separation zone. Approximately 16 miles west of the Golden Gate, these lanes enter a "Precautionary Area" where traffic is merged with eastbound traffic lanes through the Bar Channel toward San Francisco Bay. Additional information, including maps, is presented in Section 4.1, Operational Safety/Risk of Accidents.

Once inside the Precautionary Area, vessels must contact the San Francisco Vessel Traffic System on Yerba Buena Island. Vessels pass through Regulated Navigational Areas (RNA) on their way to the Richmond Long Wharf. Vessels calling at the Long Wharf typically pass through the San Francisco Bay RNA, the North Ship Channel RNA, and the Southampton Shoal/Richmond Harbor RNA. RNAs organize traffic flow patterns to reduce vessel congestion where maneuvering room is limited; reduce meeting, crossing, and overtaking situations between large vessels in constricted channels; and limit vessel speed. Additional details on the RNAs used by vessels calling at the Long Wharf are provided in Section 4.1.3, Impact Significance Criteria.

Vessels transit San Francisco Bay along one of several traffic lanes depending on their draft. These include the Deep Water Traffic Lane north of Harding Rock or the westbound/eastbound traffic lanes north/south of Alcatraz.

Lightering operations are performed infrequently but are typically conducted at Anchorage No. 9 in San Francisco Bay. Anchorage No. 9 accommodates large deep draft vessels and is the only anchorage that allows lightering in the Bay due to sensitive resources near other anchorages. The location of Anchorage No. 9 is shown in Figure 4.2-1 in Section 4.2, Operational Safety/Risk of Upset. Lightering to reduce ship draft typically involves the transfer of petroleum liquids from a large ship to a smaller vessel prior to delivery to the Long Wharf. While such operations are typically associated with ANS crude deliveries, circumstances that require lightering operations are varied and not necessarily related to specific vessels or cargo. Lightering operations are also conducted using vapor balancing to meet emission limits specified under the BAAQMD Regulation 8, Rule 46, Marine Tank Vessel to Marine Tank Vessel Loading. Over the period from 1993 through 2001, an average of 29 to 30 ships per year lightered prior to arrival at the Long Wharf, which is a valid number for estimating continued future lightering operations (personal communication, Don Kinkela, Chevron Products Company 2005).

2.3.6 Oil Spill Response Capability

Oil spill containment and cleanup procedures are based on using: (1) Containment boom strategically located on the Long Wharf to facilitate rapid deployment when used in conjunction with several sections of permanently installed boom; (2) other first-response cleanup equipment such as sorbent boom, sweeps and sheets; (3) equipment and manpower available through contractual agreement with local suppliers; and (4) Chevron's membership in the Marine Spill Response Corporation (MSRC).

The Long Wharf falls within high velocity current criteria for onshore terminals as defined by CCR Article 5, section 2395, subsection (b)(3). As a result, vessels are not boomed on a per-visit basis. Instead, Chevron uses dock manpower and utility boats, which have the capability to deploy 600 feet of boom within 30 minutes, for spill containment.

Boom deployment would begin within 15 minutes after a spill has been detected, with a minimum of 600 feet deployed within 30 minutes and at least 1,000 feet deployed within 1 hour. Several sections of containment boom (approximately 3,500 feet) are permanently installed beneath the Long Wharf at strategic locations to rapidly contain a ship's oil by connecting sections of portable boom to each end of the permanent sections. Additional boom, totaling over 9,000 feet, is located on utility boats, on Reel-Paks on Berths No. 1 and No. 4, at the storage area at the south end of Berths A and B for deployment by utility boat, and on a spill response trailer staged at the refinery boat harbor. Absorbent material for rapid cleanup is also stored in equipment trailers in the Berth No. 1 area, as well as a supply of sorbents in the Command Post.

Other emergency response equipment that is located on the Long Wharf includes fire extinguishing equipment (fire monitors, foam boxes, firewater lines, firewater booster pump, fire detection and alarm systems, fire extinguishers, and fire blankets) and safety equipment (eye wash/safety showers, air-supplying respirators, life rings, Jacob's ladders, and stokes stretchers). In addition, the Refinery's own Fire Department responds to incidents on the Long Wharf. The Richmond Municipal Fire Department is available through a mutual aid agreement.

The MSRC and associated contractors can be called upon when the facility determines that additional control, containment, and/or cleanup resources are necessary. The nation-wide resources of the MSRC are available as needed. MSRC is the largest U.S. oil spill response organization for coastal and offshore spills and assists in responses that exceed the capabilities of smaller, local response organizations.

Additional discussion on oil spill response capability and effectiveness is presented in Section 4.1, Operational Safety/Risk of Accidents.